

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/06/2011 has been entered.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Robert M. Siminski, Reg. No. 36007 on Oct. 14, 2011.

Claim 9 has been amended as follows:

Replace the content of claim 9 with --

9. A receiver for radio navigation signals that are transmitted in spread spectrum and that comprise (i) a data channel that is modulated by a navigation message and (ii) a pilot channel that is not modulated by the navigation message, the data channel and the pilot channel being combined into one multiplexing scheme in order to modulate a carrier, the receiver comprising:

a discrete navigation system that determines a Doppler velocity aid, wherein the discrete navigation system does not rely only on the radio navigation signals, and wherein the discrete navigation system combines information from the radio navigation signals with other information that is independent of the radio navigation signals;

a despreading and tracking device comprising (i) a spreading code generator that supplies spreading codes and (ii) first means for applying the spreading codes to the pilot channel and the data channel in order to obtain despread pilot and data signals;

a demodulator that, with the aid of the carrier obtained from the despreading processing of the pilot channel, uses the despread pilot signal to demodulate the despread data signal in order to obtain the navigation message;

wherein the despreading processing is performed by code tracking processing combined with at least one of carrier phase tracking processing or carrier frequency tracking processing;

second means for performing code tracking and one of estimating or tracking frequency or phase of the despread pilot signal, wherein the second means is designed to receive the Doppler velocity aid from the discrete navigation system;

wherein the code tracking processing is performed using a delay-lock loop (DLL) or an open-loop device of zero order, and

wherein the carrier tracking processing is performed with the aid of a frequency-lock loop (FLL) using an open-loop filter of first or second order. --.

Allowable Subject Matter

3. Claims 1-3, 5, 8, 9, 12-15 are allowed.
4. The following is an examiner's statement of reasons for allowance:

The instant application is an invention of receiving navigation signals that are transmitted in spread spectrum using a data channel and a pilot channel. A despreading processing is performed on the data channel and the pilot channel. The pilot channel is despreaded to obtain the carrier that is used in the demodulation of the despreaded data signal to obtain the navigation signal. The despreading processing is performed by code tracking and one of the carrier phase tracking or carrier frequency tracking. The invention specifically recites that the code tracking is performed using a delay-lock loop or an open-loop device of zero order, and the carrier phase tracking or carrier frequency tracking is performed using an open-loop filter of first or second order.

The best available prior art of record by Schilling (US 6,396,824 B1), Lin (US 2001/0020216 A1) and Crow et al (US 3,740,671) discloses an analogous system, but Schilling, Lin and Crow fail to disclose the code tracking is performed using a delay-lock loop or an open-loop device of zero order, and the carrier phase tracking or carrier frequency tracking is performed using an open-loop filter of first or second order. The Examiner considers these

limitations very specific and unique. Therefore, the independent claims (claims 1 and 9) are allowable. Since claims 2, 3 5 and 8 are depending on claim 1, and claims 12-15 are depending on claim 9, those dependent claims become allowable accordingly.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIHONG YU whose telephone number is (571)270-5147. The examiner can normally be reached on 8:30 am-7:00 pm Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lihong Yu/
Examiner, Art Unit 2611
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611